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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/609,068      | 06/27/2003  | Andrew James Cameron | 47406-013000        | 7462             |

33717 7590 06/21/2006

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| EXAMINER |
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SHAH, SAMIR M

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

2856

DATE MAILED: 06/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                       |  |
|------------------------------|------------------------|-----------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b>   |  |
|                              | 10/609,068             | CAMERON, ANDREW JAMES |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>       |  |
|                              | Samir M. Shah          | 2856                  |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 4-7, 9-13 and 17-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings were received on 6/05/2006. These drawings are acceptable.

### ***Response to Arguments***

2. Applicant's arguments, see page 9, filed 6/05/2006, with respect to the objection of the drawings, the specification and claims 4, 5, 9, 10, 17 and 18 have been fully considered and are persuasive. The objection of the drawings, the specification and claims 4, 5, 9, 10, 17 and 18 has been withdrawn.
3. Applicant's arguments with respect to claims 1-3, 8 and 14-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 102 or 103***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-3, 8 and 14-16 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kim et al. (US Patent 6,484,300 B1 henceforth "Kim").

(a) As to claims 1 and 8, Kim discloses "a method of obtaining an effective pattern density" in an "integrated circuit"/determining the density variations of a material on multi-layer wafer including the steps of: "defining a grid of pattern cells" on each layer stacked on a wafer (column 7, lines 24-40, 61-67; column 8, lines 1-16; column 15, lines 10-13); determining a pattern density or the amount of metal within a given area in each grid element, each grid element having unique grid system co-ordinates (figure 4) and thereby computing a measure of the pattern density from the area of the material/metal in grid elements/pattern cells/windows in at least two of the layers stacked on a wafer (figure 4; column 3, lines 43-45, column 7, lines 22-40, 61-67; column 8, lines 1-16) (for a detailed description of "pattern density" please refer to US Patent 5,552,996 to Hoffman et al.). Kim also discloses that a relative height difference in a patterned layer of an integrated circuit may degrade the operating characteristics of the integrated circuit and thus, prove to be a defect (column 1, lines 32-41); therefore, Kim discloses

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predicting a defect in the integrated circuit by detecting such a height difference on a layer of an integrated circuit, through the measure of the pattern density.

As to claims 1 and 8, Kim does not expressly disclose "in at least two layers in the multi-layer printed circuit board" (PCB) but teaches the method being used on each layer stacked on a wafer which is a functional equivalent of a printed circuit board and it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement Kim's method of obtaining an effective pattern density, on plurality of layers on a multi-layer printed circuit board which would be similar to multiple layers stacked on a wafer, as suggested by Kim.

(b) As to claim 14, Kim discloses "a system for obtaining an effective pattern density" in an "integrated circuit"/for determining the density variations of a material on a multi-layer wafer including: "means for defining a grid of pattern cells" on a layer of an integrated circuit/each layer stacked on a wafer (column 7, lines 24-40, 61-67; column 8, lines 1-16; column 17, lines 18-22); means for determining a pattern density or the amount of material/metal within a given area in each grid element/pattern cell/window, of the grid system, on each of the layers stacked on a wafer (figure 4; column 3, lines 43-45, column 7, lines 22-40, 61-67; column 8, lines 1-16) (for a detailed description of "pattern density" please refer to US Patent 5,552,996 to Hoffman et al.) and means for computing a measure of the pattern density from the area of the material/metal in grid elements/pattern cells/windows in at least two layers of the multi-layer (figure 4; column 3, lines 43-45, column 7, lines 22-40, 61-67; column 8, lines 1-16; column 17, lines 23-25).

As to claim 14, Kim does not expressly disclose "in at least two layers in the multi-layer printed circuit board" (PCB) but teaches the method being used on each layer stacked on a wafer which is a functional equivalent of a printed circuit board and it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement Kim's method of obtaining an effective pattern density, on plurality of layers on a multi-layer printed circuit board which would be similar to multiple layers stacked on a wafer, as suggested by Kim.

(c) As to claims 2, 15, the Examiner takes official notice that copper is widely known in the semiconductor industry to be used for fabrication of chips and printed circuit boards and it would have been obvious to one of ordinary skill in the art at the time the invention was made to use copper, in Kim's integrated circuit, for its increased conductivity and for its cheaper cost as compared with other conductive metals such as gold and silver.

(d) As to claims 3, 16, the Examiner takes official notice that rectangular shape is widely known to be used in defining a grid system and it would have been obvious to one of ordinary skill in the art at the time the invention was made to define Kim's grid of pattern cells to have rectangular cell-shape in order to perform systematic mathematical calculations of the density measurement (for example, see US Patent 6,189,130 B1 to Gofman et al., column 5, lines 48-59).

***Allowable Subject Matter***

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8. Claims 4-7, 9-13, 17-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

9. The prior art made of record and not relied upon, cited in the attached 892 form, is considered pertinent to applicant's disclosure.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

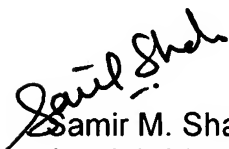
11. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

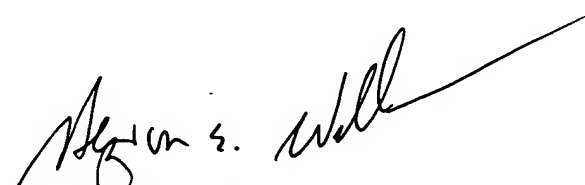
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samir M. Shah whose telephone number is (571) 272-2671. The examiner can normally be reached on Monday-Friday 9:00 am to 5:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Samir M. Shah  
Art Unit 2856  
6/14/2006

  
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